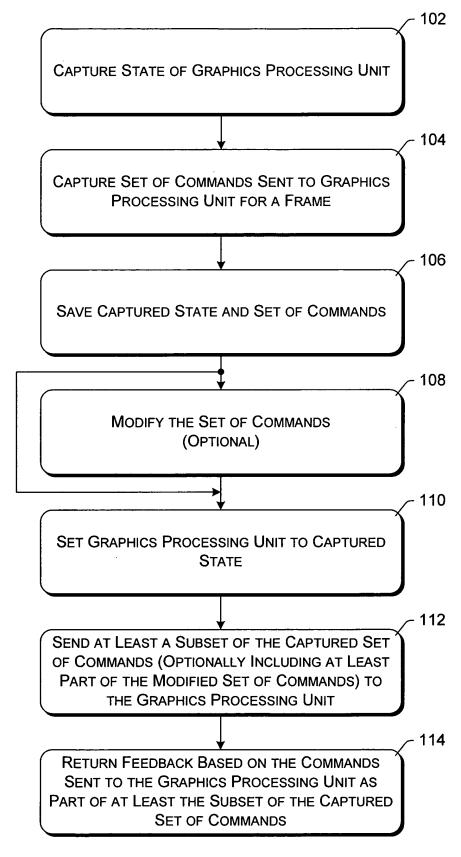
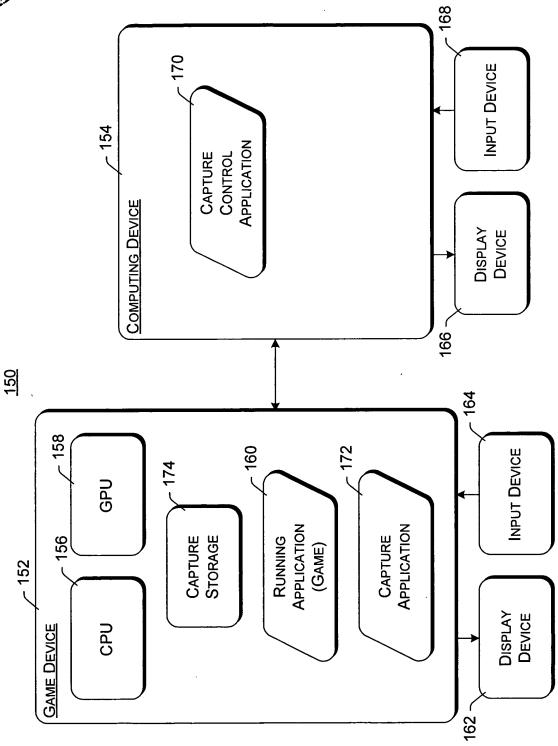
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Docket No.: MS1-1705US
Inventor(s): Kyle R. Johns and J. Andrew Goossen
Title: User Interface for Facilitating Performance Analysis for Processing



- 154

Docket No.: MS1-1705US
Inventor(s): Kyle R. Johns and J. Andrew Goossen
Title: User Interface for Facilitating Performance Analysis for Processing



Zig. 2



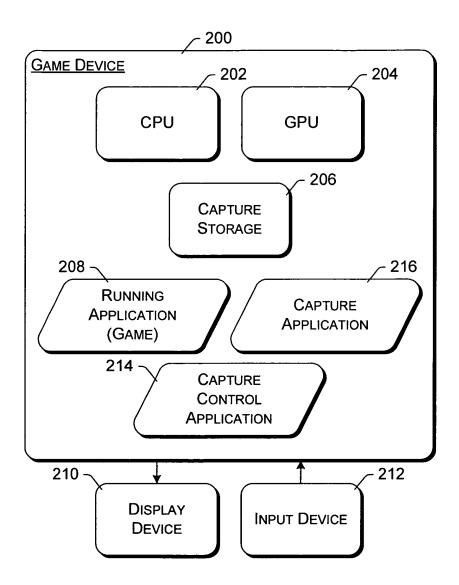
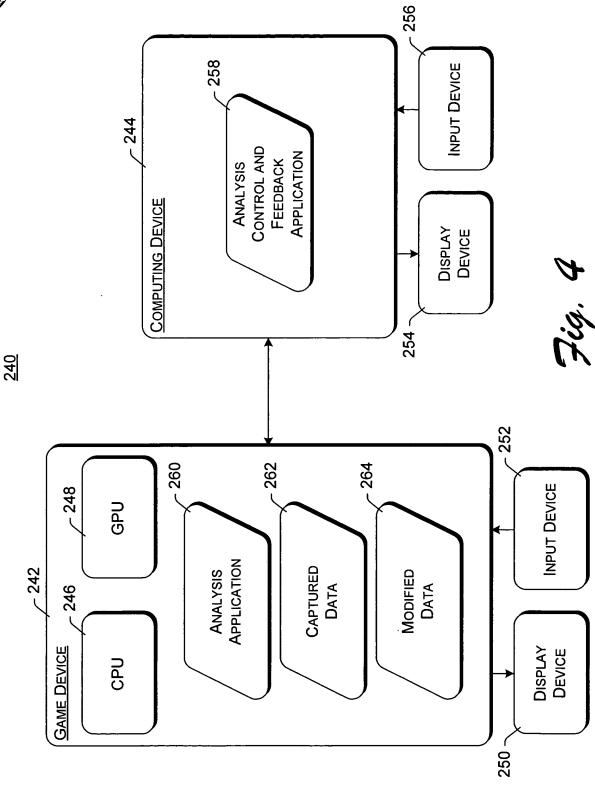


Fig. 3







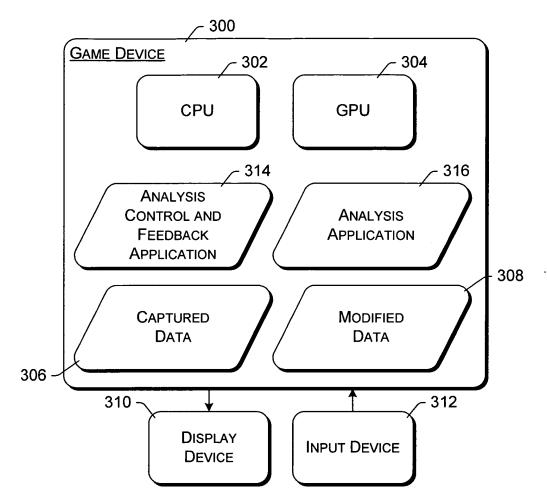


Fig. 5



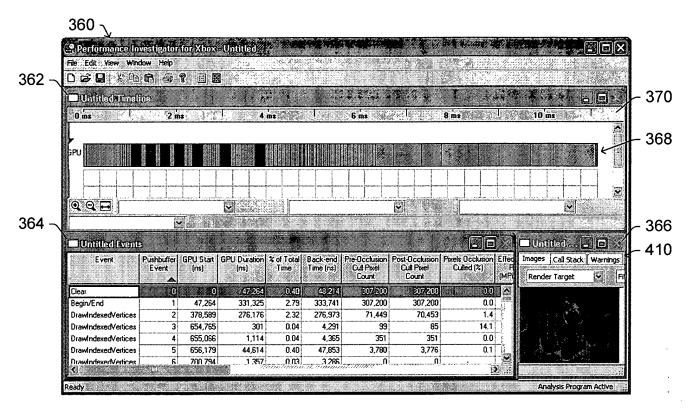


Fig. 7

Timeline Window

342

Events Window

344

Frame Window

346



380 🔨

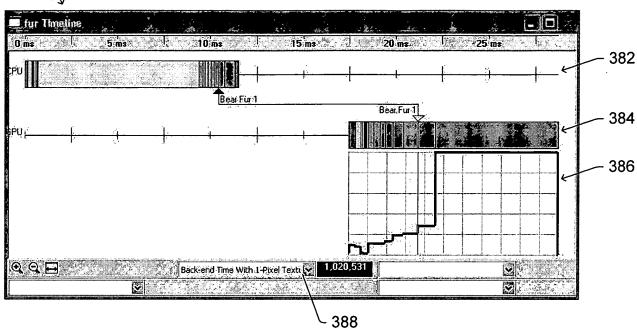


Fig. 8



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R fur Events	ng mankering	erandik radion alkarı alık	encest in still retailmentities in se	* * * * *	***	11 2 7	* * [
Event	ĪD	CPU Start	CPU Duration		GPU Duration	8d log	Bedrend	Selop
	1977	(ns)	(ns)	(ns)	(ns)	lime	(Enjenit	nmelvs
KickPushBuffer	0	0	14,449	-	-	-	-	- [6
⊕-FrameMove	1	36,612	101,750	•	0	-	•	-
Clear	3	144,537	4,698	15,745,863	48,640	-		- [
Begin/End	4	181,781	29,929	15,794,503	331,584	-	-	
🖨 ுBear Mesh 0								
DrawIndexedVertices	6	252,563	125,782	16,126,087	278,176	-	•	-
KickPushBuffer	7	339,091	5,501	-	-	-	-	-
KickPushBuffer	8	374,790	3,385	-	•	-		
DrawIndexedVertices	9	386,209	10,399	16,404,263	3,072	-		-
DrawIndexedVertices	10	401,332	6,393	16,407,335	2,656	-	-	-
⊕-Bear Mesh 1	11	409,555	56,960	16,409,991	45,568	•	-	-
⊕ Bear Mesh 2	15	466,773	39,522	16,455,559	74,208	-	-	-
⊕-Bear Mesh 3	19	506,536	91,996	16,529,767	59,072	-	-	-
⊞Bear Mesh 4	25	598,778	53,437	16,588,839	47,232	•	-	
⊕ Bear Mesh 5	29	652,769	39,348	16,636,071	47,552	-	-	- 2
⊕ Bear Mesh 6	33	692,356	37,207	16,683,623	45,248	•	-	- 🗦
⊕-Bear Mesh 7	37	729,799	92,051	16,728,871	50,783	-	-	- ਪੂ
⊜ _∵ Bear Fur 7					* * * *	* * * *	\$1 .00 6	
⊕-DrawFins	44	852,610	122,595	16,779,656	156,932	-	-	- 1
⊕ DrawShells	73	975,455	40,536	16,936,616	61,407	-	-	- 5
⊕ Bear Fur 6	75	1,019,798	117,933	16,998,024	219,011	-	-	- 62
⊕ Bear Fur 5	107	1,138,001	7,341,552	17,217,064	224,739	-	-	- 4
⊕ Bear Fur 4	142	8,479,990	164,020	17,441,832	284,642	-	-	- 5
KO P T POP THE P P		- minima & market market	or the same of	. The state of the	Allen Anne Comment of the Control of	, a militarita de la composição	\$200 SEC. 1880	<u> </u>



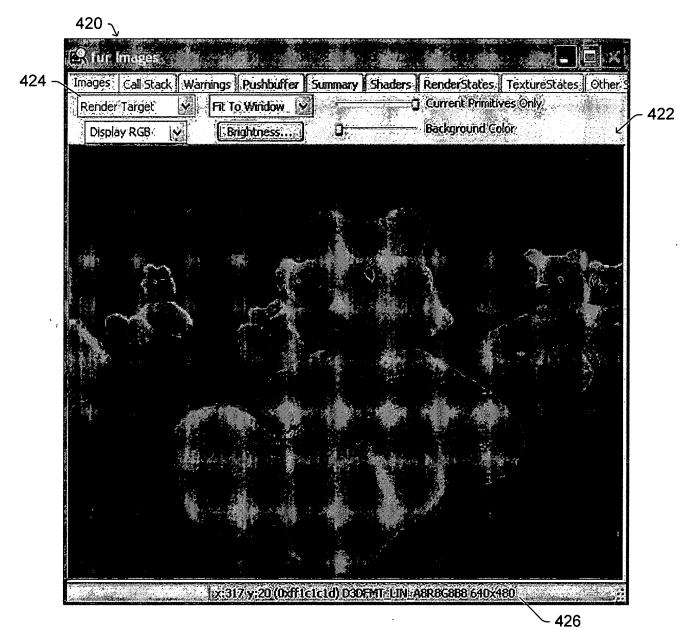


Fig. 10



420 _{\(\sqrt{}\)}

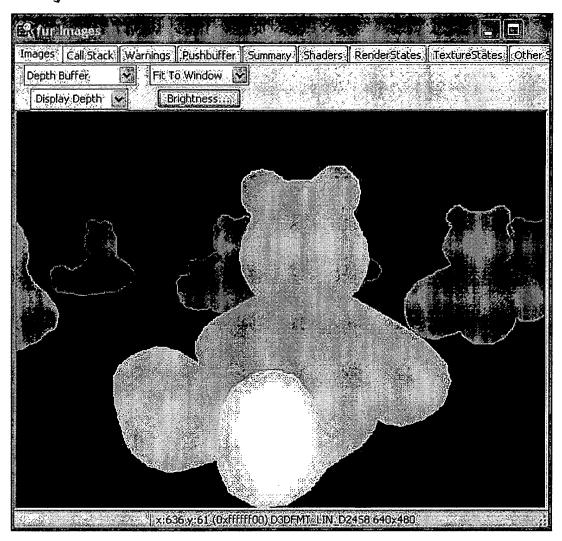


Fig. 11



420 _{\(\sqrt{}\)}

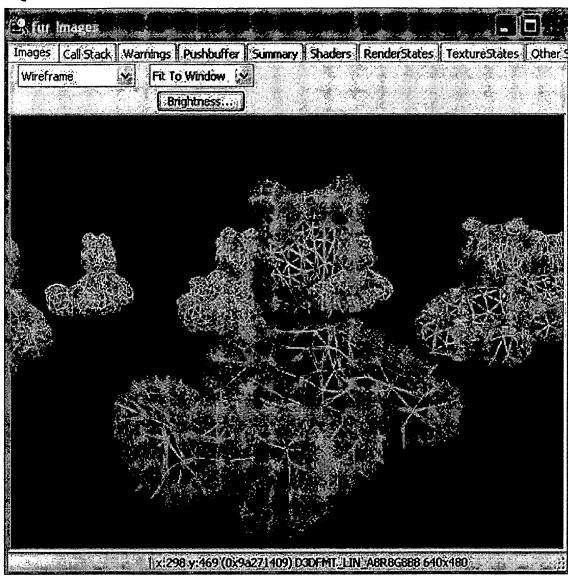


Fig. 12



420 _{\(\sqrt{}\)} fur Images Images Call Stack Warnings Pushbuffer Summary Shaders RenderStates TextureStates Others Fit To Window 🐶 All Textures 434 428 430 432 No Texture

Fig. 13



420 _{\(\sqrt{}\)}



Fig. 14



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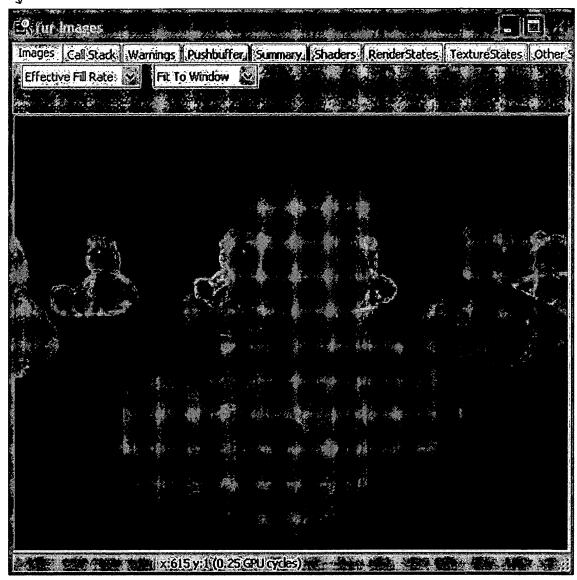


Fig. 15



450 _{\(\sqrt{}\)}

The second second second second	File: c:\xboxbins\dump	8	Browse: Resolve Symbols
Event	Sýmbál	¿Line	File
Block@nObject	D3D::BlockOnTime D3D::BlockOnNonSurfaceResource D3DFiжup_Reset; CXBoxSample::FrameMove CXBApplication::Run main mainXapiStartup	537 1287 1857 363 294 108 54	c:\xbox\piivate\windows\directx\dxg\d3d8\se\pusher.cpp c:\xbox\piivate\windows\directx\dxg\d3d8\se\pusher.cpp c:\xbox\piivate\windows\directx\dxg\d3d8\se\pushres.cpp c:\xbox\piivate\atg\samples\graphics\pushbuffer\pushbuffer c:\xbox\piivate\atg\samples\common\src\xbapp.cpp c:\xbox\piivate\atg\samples\graphics\pushbuffer\pushbuffer c:\xbox\piivate\ntos\xapi\df\xapidc.c
Clear::	D3DDevice: Clear CXBoxSample: Render main: main:XapiStartup	74 383 108 54	c:\xbox\private\windows\directx\dxg\d3d8\se\clear.cpp c:\xbox\private\atg\samples\graphics\pushbuffer\pushbuffer c:\xbox\private\atg\samples\graphics\pushbuffer\pushbuffer c:\xbox\private\ntos\xapi\dlf\xapi0.c
RunPushBullet	D3DDevice_PunPushBuffer CXBoxSample:;Rénider main mainXapiStartup	1223 386 108 54	c:\xbox\private\windows\directx\dxg\d3d3\se\prishres.cpp c:\xbox\private\atg\samples\graphics\prishbuffer\prishbuffer c:\xbox\private\atg\samples\graphics\prishbuffer\prishbuffer c:\xbox\private\ntos\xapi\df\xapi0.c
DrawVerticesUP			
DrawVertices:			
Begin/End	D3DDevice_Begin CXBront:Begin CXBoxSample:Render main .main:XapiStartup	1196 448 387 108	c:\xbox\private\windows\directx\dxg\d3d8\se\drawprim.cpp c:\xbox\private\atg\samples\common\src\xbfont.cpp c:\xbox\private\atg\samples\graphics\pushbuffer\pushbuffer c:\xbox\private\atg\samples\graphics\pushbuffer\pushbuffer. c:\xbox\private\ntos\xapr\df



460 \(\sqrt{2} \)

ig Bru	r Warnings		
Image	s Call Stack Warnin	gs Pushbuff	er Summary Shaders RenderStates TextureStates Other State
3538 2	splay Priority <u>1</u> Warning		ay Priority 2 Warnings Display Priority 3 Warnings
ID	Event	Priority	Message
3	Clear 3/2	3	If all redundant state setting were perfectly eliminated, rendering of entire scene would be 0.
		2	The CPU's floating point precision is set to 53 bits. Consider calling _controlfp[_PC_24, _MC
4	Begin/End	3	Vertex shader is writing to 9 output registers that are unused by the current pixel shader.
		3	To make best use of pixel pipelines and swathing, use a single clipped triangle that covers the
74	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
106	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
138	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
173	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
206	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
210	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
243	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
247	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
280	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
282	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
284	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
288	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
321	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
325	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
329	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
333	DrawIndexedVertices	3	Vertex shader is writing to 1 output registers that are unused by the current pixel shader.
336	Begin/End	2	D3DPRESENT_INTERVAL_ONE_OR_IMMEDIATE and D3DPRESENT_INTERVAL_TW(
₹]		300 <u>0</u> 3	

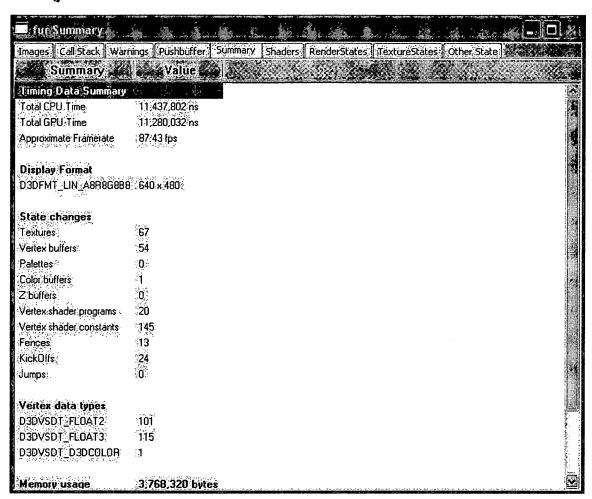


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7., X	Pushbuffer Disassembly			
mages Call Star				
Event	· Pushbuffer	Size	Attributes	1.0
BlockOnObject				į
Clear	Clear(D3DCLEAR_TARGET ID3DCLEAR_ZBUFFER ID3DCLEAR_STENCIL)	28		
RunPushBuller		· ·	* .	
DrawVerticesUP	D3DRS_PSCOMBINERCOUNT	8	Redundant	
	D3DRS_PSRGB(NPUTS*	36	Redundant	
	D3DRS_PSRGBOUTPUTS*	36	Redundant	
	D3DRS_PSALPHAINPUTS*	36	Redundant	
	D3DRS_PSALPHADUTPUTS*	36	Redundant	- 3
	LazySetShaderStageProgram	8	Redundant	
	SetVertexShaderConstant	44		
	SetVertexShader/SelectVertexShader	208		1
	LazySetSpecFogCombiner	8	Redundant	1
	D3DRS_PSFINAL COMBINERINPUTSABCD	8		
	D3DRS_PSFINALCOMBINERINPUTSEFG	4		7
	LazySetState/SetVertexShaderInput	100		1 8
	Jumps	4		
	D3DRS_CULLMODE	8		-
	D3DRS_ALPHABLENDENABLE	532		
	SetVertexShaderConstant	76		
	SetVertexShader/SelectVertexShader	136	La come concess	34 34 34 34 A
	CommonSelViewport	52	Redundant	
	SetVertexShader/SelectVertexShader	8	Redundant	*
in the same of the	D3DRS_PSCOMBINERCOUNT	8		\$
	D3DRS_PSRGBINPUTS*	36		
, manager	D3DRS_PSRGBOUTPUTS*	36	E-	A. U. S.
	D3DRS PSALPHAINPUTS*	36	1.	1 %



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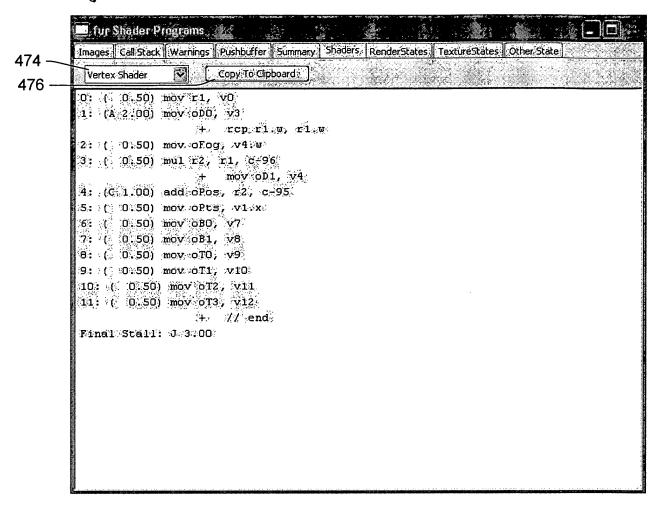


Fig. 20



480 _{\(\sqrt{}\)}

💻 fur RanderStates		X
- mag	Summary, Shaders: RenderStates TextureStates: Other State	
RenderState	CONTROL OF AN ADMINISTRATION OF THE PROPERTY O	4
DODRS ALPHABLENDENABLE	TRUE	
DODRS ALPHAFUNC	D3DCMP_GREATEREQUAL.	
D3DRS_ALPHAREF	(0x08)	
D3DRS_ALPHATESTENABLE	TRUE:	
D3DRS BACKFILLMODE	DSDFIEL-SOLID	A.
D3DRS-BLENDCOLOR	· 0x00000000	
D3DRS_BLENDOP	D3DBLENDOP_ADD	
D3DRS COLORWRITEENABLE	.D3DC0L0RWRITEENABLE: ALL	
D3DRS CULLMODE	D3DCULL CCW	
D3DRS DEPTHCLIPCONTROL	D3DDCCCCULLPRIMITIVE	Ŝ.
D3DRS DESTBLEND	D3DBLEND_INVSRCALPHA	ş _u d _w oid
D3DRS DITHERENABLE	FALSE	eroe A
D3DRS_DONOTCULLUNCOMPRESSED?	FÄLSE	3400
D3DRS DXT1NOISEENABLE	FALSE	With the second
D3DRS EDGEANTIALIAS	FALSE	
D3DRS FILLMODE	.D3DFILL_SOLID	à l
D3DRS_FOGCOLOR	0x0000000	186 C
D3DRS_FOGDENSITY		S. S.
D3DRS_FOGENABLE	FALSE	**************************************
D3DRS_FOGEND	* ?	ž.
D3DRS_FOGSTART	~? }	2
D3DRS_FOGTABLEMODE	D3DFOG_NONE	5
D3DRS_FRONTFACE	D3DFRONT_CW	et de
D3DRS_LIGHTING	FALSE	60.60
D3DRS_LINEWID TH	1,000	}
D3DRS LOCALVIEWER.	FALSE	V



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Try Texture States		
Images Call Stack Warnings Pushbuffe	r Summary Shaders RenderStates TextureStates Other State	, '
Texture State	Value	,,
Textora Umi 0 + 3 16 1 4 4 4 4 4 4	77 18 18 18 18 18 18 18 18 18 18 18 18 18	A
D3DTSS_ADDRESSU	D3DTADDRESS_WRAP	
D3DTSS_ADDRESSV	D3DTADDRESS_WRAP	
D3DTSS_ADDRESSW	D3DTADDRESS_WRAP	
D3DTS\$_ALPHAKILL	D3DTALPHAKILL_DISABLE	Ħ
D3DTSS_BORDERCOLOR	0x00000000	П
D3DTSS_BUMPENVLOFFSET	÷	
D3DTSS_BUMPENVLSCALE	•	
D3DTSS_BUMPENVMAT00	<i>≨</i>	7.
D3DTSS_BUMPENVMAT01	v	
D3DTSS_BUMPENVMAT10	+:	
D3DTSS_BUMPENVMAT11	- >	999
D3DTSS_COLORKEY	0x0000000°	A
D3DTSS_COLORKEYOP	D3DTCOLORKÉYOF_DISABLE	900
D3DTSS_COLORSIGN	0	Walk I
D3DTSS_MAGFILTER	D3DTEXF_LINEAR	9000 1000 1000 1000 1000 1000 1000 1000
D3DTSS_MAXANISOTROPY		
D3DTSS_MAXMIPLEVEL	0,	444
D3DTS\$_MINFILTER	D3DTEXF_LINEAR	
D3DTSS_MIPFILTER	D3DTEXF_LINEAR	0 × ×
D3DTSS_MIPMAPLODBIAS	0.000	\$ \$
D3DTSS_TEXCOORDINDEX	?	
D3DTSS_TEXTURETRANSFORMFLAGS	2	200 P
Texture Unit 1		
D3DTSS ADDRESSU	D3DTADDRESS WRAP	v



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■ fur Other St	aje vý ka vý a ja j	Š.
Images Call Stack	Warnings Rushbuffer Summary Shaders RenderStates TextureStates Other State	
State	Value	
'Color buffer	640x480, D3DFMT_LIN_A8R8G8B8, address 0x3d04000, pitch 0xa00	G
Depth buffer		9
Color tile	Tile 0; address 0x3d04000; pitch 0xa00; size 0x258000	
Depth tile		ķ,
Scissors	Inclusive (0, 0, 640, 480)	
Depth clip planes	0.0.1677.7215.0	
VisibilityTest	FALSE	
Texture 0	Texture 128x256, D3DFMT_A4R4G4B4; address 0x3bc8000	
Texture 1	A consistency of the state of the consistency of the state of the constant of	
Texture 2	No.	
Texture 3	e,	
Stream v0	D3DVSDT_FLOAT3, address 0x3a9b000, pitch 0x10	
Stream v1	A Company of the Comp	=
Stream.v2	A service and a service of the servi	
Stream v3	D3DVSDT_D3DC0U0A; address: 0x3a9b00c; pitch 0x10	4
Stream v4		
Stream v5	20	
Stream:v6		
Stream v7		
Stream v8	-/-	
Stream v9		
Stream v10	No.	
Stream v11	€ C	
Stream v12:	•·	Ш
Stream v13		2
Stream v14		<u> Y</u>

FEB 1 9 200 50

Docket No.: MS1-1705US Inventor(s): Kyle R. Johns and J. Andrew Goossen

Title: User Interface for Facilitating Performance Analysis for Processing

GPU Debugger Pixel <350,256> . **O**X Copy Text to Clipboard Copy Window Image to Clipboard <- Back Close Pixel History All GPU operations affecting pixel <350,256> on the current render target up to and including, event 290: Bear Fur 0/ 12 operátions. he gamma ramp set for the Render Target in the Images Window is used to display colors in this window Initial framebuffer values 502 Initial framebuffer color: Initial framebuffer depth: Initial framebuffer stencil: 504 Event 3: Clear Framebuffer depth after clear: 216777215:000000 Framebuffer stencil after clear: 0x00 lump to this Event Event 4: Begin/End Rimitive 0 Jebug this pixel shader etug this mesh Jump to this Event 506 0xff353542 Pixel shader output colors Framebuffer color after blends ... 0xff353542 Event 6: Bear Mesh O/DrawIndexedVertices Primitive 1430 Debug this pixel shader. Jebua this mash lump to this Event 0xff3b2a26 Pixel shader output color: Pixel shader output depth: 13646101.000000 506 -Framebuffer color after blend: 0xff3b2a26 Framebuffer depth: after blend: 13646101:000000 Framebuffer stencil after blend: 0x00 jig. 9A Event 321: Bear Fur O/DrawShells/DrawIndexedVertices Primitive 1419



	GPU Debugger Event 4, Vertex 0, Pixel <350,256>
	Close Rack Copy Text to Clipboard Copy Window Image to Clipboard
	Pixel Shader Debugger 🔹 🦇 👐 🔻 🔻 🔻
	Pixels<350, 256> Event 4: Begin/End The gamma ramp set for the Render Target in the Images Window is used to display colors in this window.
	Reg A R G B Color
	Combiner 0 mov.ro.rgbvo_sat.rgb + mov.ro.avo_sat.a Inputs:: vo:: 0x0ff.0x035.0x035.0x042.
	Outputs: r0: 0x0ff 0x035 0x035;0x042
	xfc zero; sat rgb; zero; sat rgb; zero; sat rgb; r0 sat rgb; zero; sat rgb; zero; sat rgb; zero; sat rgb; zero Inputs::
522	This pixel was rendered using a vertex shader program from the following primitive with 3 vertices:
JZZ.	Tindex



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Manager Services	Shac	ler Del	ougger			سنند مُكَانَّ سنات	and and a short time in a		\$	i Si ta
ent 4: Bed rtex 0 instructio	EN VANARA L									
Reg	X	Outputs	2	U	Reg	X	Input Y	: s	9	u
mov.rl.	y0 -0.5	-0.5	1	1			-0.5	1		1
mov oD	0. v3 +	rcp rl.w.,r 1625 0.1 -0.5	1.w		V3: 0.()625 O.C	iis Suulsia			1
mov oF	og. v4 w									
ofog:	0		0 5.42	101e-020	V4:	0	0	O,	S.42101e	-020
mul r2.	r1, c-96	+ moy of)1, y4"	entition of the contract of th						
oP1:	0	-ó.S 1.67772 0	0 5.42	101e-020		0.5 - 1 0	0.5 11.67 0	1 772e+007 0	5.42101e	1 1 -020
add oPd	Brown's transfer decrease in		:e+007	1	r2: c-95:		-0.5 1.67 0.5	772e+007 0	8.42101e	1 -020
mov oP	Man or the Man to be been a property).25 -0.3	ses the do best - a common more).304635				-0.92849		1
oPts:				1						} :



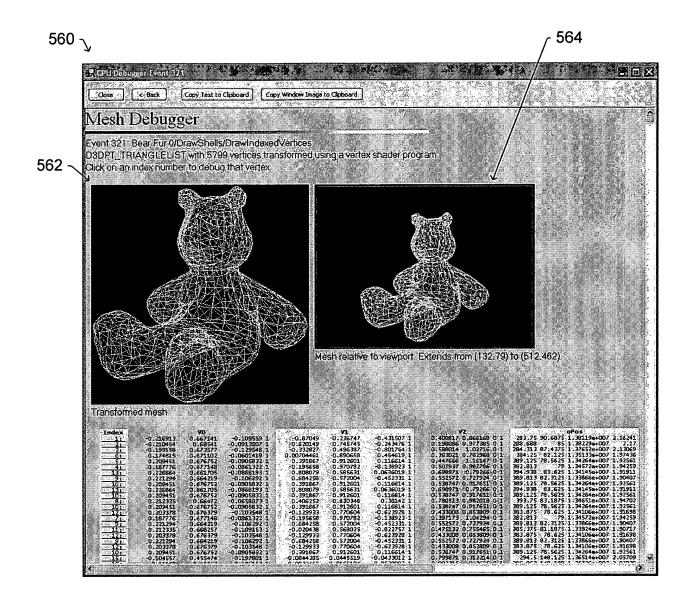


Fig. 27

Docket No.: MS1-1705US Inventor(s): Kyle R. Johns and J. Andrew Goossen
Title: User Interface for Facilitating Performance Analysis for Processing FEB 1 9 2004 8 RANE LANG 618 600 620 622 REMOTE 624 648 3653 **COMPUTING** DEVICE <u>642</u> 652 656 -INTERNET 0000 **MONITOR MODEM** LAN 650 -**REMOTE** 658 **APPLICATION PROGRAMS** 602 606 -608 644 654 SYSTEM MEMORY 000 **OPERATING** 00000 **N**ETWORK SYSTEM 626 VIDEO ADAPTER **ADAPTER** 626 **APPLICATION** SYSTEM BUS PROGRAMS 628 DATA MEDIA **INTERFACES** OTHER PROGRAM 604 MODULES 630 **OPERATING 626 PROGRAM** 616 SYSTEM **DATA** 632 APPLICATION 628 **PROCESSING** <u>610</u> RAM **PROGRAMS** UNIT PROGRAM 630 MODULES 640 **BIOS** PROGRAM 632 614 **DATA** 000 <u>612</u> **ROM** I/O INTERFACES 638 0 000000 00 OTHER DEVICE(S) PRINTER **KEYBOARD** Mouse Fig. 28 646 636 634